## Space Weather Forecast

Issued on Saturday, 01 June 2024 at 12:25 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

**Space Weather Forecast Headline: High activity with further Moderate or Strong flares likely.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** High with two Strong flares observed at 01/0848 UTC and X1.1 at 31/2203 UTC, both from the active sunspot region on the southeast disc. Despite being much reduced in size from its previous hyperactive incarnation on the last rotation, this remains a moderately sized and complex region with opposite magnetic polarities within the same spot. Some ongoing growth has also been observed. There are seven numbered regions with ongoing growth also observed in spots in the northeast and just west of north-centre, however these remain simple bipolar groups. A further sunspot region in the northwest continues to gradually simplify, breaking into smaller component spots.

No Earth-directed coronal mass ejections (CMEs) were visible in available imagery, with neither Strong flare appearing to be eruptive.

**Solar Wind / Geomagnetic Activity:** Observations by ACE showed speeds persisting at background 330-370 km/s. Interplanetary Magnetic Field was generally weak with the north-south component predominately negative (southward). Geomagnetic activity was Quiet (Kp 1-2).

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms occurring.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** High to Moderate activity with further occasional Moderate class or Strong class flares expected, mainly from the complex sunspot in the southeast.

**Solar Wind / Geomagnetic Activity:** Weak CME from a common class flare off the northeast disc on 31 May is expected either late day 2 or early day 3 (02-03 Jun), although confidence is low with the strength of any arrival due to the faint and weak nature of the CME. Otherwise background winds are likely to persist, with a chance of becoming slightly enhanced for a time later day 1 or day 2 (01-02 Jun) with any onset of the fast wind from a small coronal hole, however this is also low confidence. Mainly Quiet geomagnetic activity is expected, with chance of rising to Unsettled or Active with either of these enhancements. There is a slight chance of an isolated G1 Minor Storm interval

**Energetic Particles / Solar Radiation:** The count rate of energetic particles (high energy protons) is likely to persist at background levels, but with a slight chance of rising above the S1 Minor Storm level in response to any further notable flares.

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**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 5 | 10 | 20 | 5 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | Yes | 80 | 75 | 70 | 60 |
| Very Active | R3 to R5 X | Yes | 40 | 40 | 30 | 25 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 20 | 20 | 20 | 20 |
| Very Active | ≥ S3 * | No | 5 | 5 | 5 | 5 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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